

WHAT IS CLAIMED IS:

1. A purified nucleic acid molecule comprising a nucleotide
sequence of about 12 to about 709 nucleotides that encodes a *B.*
5 *lonestari* sp. nov. flagellin peptide having at least one *B.*
lonestari sp. nov.-specific amino acid or species-specific
combination of amino acids from Table 1, or a complement thereof.

10 2. The purified nucleic acid molecule of claim 1 further
defined as having a nucleotide sequence from SEQ ID NO:1, 4 or
26.

15 3. The purified nucleic acid molecule of claim 1 wherein the
nucleotide sequence encodes a protein having an amino acid
sequence of SEQ ID NO:2.

20 4. A recombinant molecule comprising the nucleic acid molecule
of claim 1.

25 5. The recombinant molecule of claim 4 wherein the molecule is
an expression vector.

6. A host cell comprising the recombinant molecule of claim 4.

30 7. The purified nucleic acid molecule of claim 1 wherein the
nucleotide sequence has from about 12 to about 641 nucleotides.

8. The purified nucleic acid molecule of claim 1 wherein the nucleotide sequence has from about 12 to about 330 nucleotides.

5 9. The purified nucleic acid molecule of claim 1 wherein the flagellin peptide has at least one *B. lonestari* sp. nov. specific amino acid and the amino acid is at position 24, 65, 67, 90, 91, 92, 99, 103, 119, 126, 127, 136, 140, 174, or 191 of SEQ ID NO:2.

10 10. The purified nucleic acid molecule of claim 1 wherein the flagellin peptide has at least one *B. lonestari* sp. nov.-specific combination of amino acids from Table 1.

15 11. The purified nucleic acid molecule of claim 1 wherein the peptide includes amino acids at and flanking positions 90-92, 103-108, 119-127, 136-144, or 171-174 of SEQ ID NO:2.

20 12. The purified nucleic acid molecule of claim 1 defined further as comprising GGTGTTCAAGCG, SEQ ID NO:7.

25 13. The purified nucleic acid molecule of claim 1 defined further as comprising GTTCAACCAGCT, SEQ ID NO:8.

30 14. A purified nucleic acid molecule comprising a nucleotide sequence represented in SEQ ID NO:1 or 3 having at least one *B. lonestari* sp. nov.-specific nucleotide or species-specific combination of nucleotides from Table 2 or 3, or a complement thereof.

15. A recombinant molecule comprising the nucleic acid molecule of claim 14.

5 16. The purified nucleic acid molecule of claim 14 defined further as having about 12 to about 641 nucleotides.

10 17. The purified nucleic acid molecule of claim 14 defined further as comprising a nucleotide sequence of SEQ ID NO: 1.

15 18. The purified nucleic acid molecule of claim 14 defined further as comprising a nucleotide sequence of SEQ ID NO: 3.

20 19. A purified peptide having an amino acid sequence comprising about 6 to about 213 amino acids of SEQ ID NO:2 that includes at least one *B. lonestari* sp. nov.-specific amino acid or species-specific combination of amino acids from Table 1.

25 20. A purified flagellin protein of *B. lonestari* sp. nov.

30 21. The purified peptide of claim 19 wherein the at least one *B. lonestari* sp. nov. specific amino acid is at position 24, 65, 67, 90, 91, 92, 99, 103, 119, 126, 127, 136, 140, 174, or 191 of SEQ ID NO:2.

35 22. The purified peptide of claim 19 defined further as comprising the sequence Gly Val Gln Ala, SEQ ID NO:5 or Val Gln Pro.

23. A fusion protein comprising the peptide of claim 19.

24. The fusion protein of claim 23 comprising SEQ ID NO:26.

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25. A method of detecting *B. lonestari* sp. nov. in a subject comprising:

10 contacting a nucleic acid sample from the subject with an
 oligonucleotide comprising a nucleotide sequence of about
 12 to about 30 nucleotides from SEQ ID NO:1 that includes
 at least one *B. lonestari* sp. nov.-specific nucleotide or
 species-specific combination of nucleotides from Table 2
15 or 3, or a complement thereof, under conditions allowing
 hybridization to form a duplex;

 wherein duplex formation indicates the presence of *B. lonestari*
 sp. nov.

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26. The method of claim 25 wherein the nucleotide sequence
comprises GGTGTTCAAGCG, SEQ ID NO:7.

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27. The method of claim 25 wherein the nucleotide sequence
comprises GTTCAACCAGCT, SEQ ID NO:8.

30 28. A method of detecting *B. lonestari* sp. nov. in a subject
 comprising:

 amplifying a segment of DNA from the subject using a set of
 PCR™ primers, wherein the segment of DNA includes at
35 least one *B. lonestari* sp. nov.-specific nucleotide or

species-specific combination of nucleotides from Table 2 or 3; and

determining the nucleotide sequence of the segment,

wherein when the nucleotide sequence of the segment is found in SEQ ID NO:1 or 3, or a complement thereof, *B. lonestari* sp. nov. is detected.

29. A method of detecting *B. lonestari* sp. nov. in a subject comprising the step of analyzing a DNA sample from the subject for a restriction fragment length polymorphism that is unique to *B. lonestari* sp. nov.

30. The method of claim 38 wherein the restriction fragment length polymorphism is from an *AluI* restriction enzyme digest.

31. A method of detecting a previously elicited immune response to *B. lonestari* sp. nov. in a subject comprising:

contacting a sample from the subject with an epitope having at least a partial amino acid sequence of SEQ ID NO:2 that includes at least one *B. lonestari* sp. nov.-specific amino acid or species-specific combination of amino acids from Table 1, under conditions allowing epitope-antibody or epitope-T cell binding to occur to form a complex;

wherein complex formation indicates the presence of a previously elicited immune response to *B. lonestari* sp. nov.

32. The method of claim 39 wherein the epitope is a flagellin fusion protein.

5 33. A method of detecting *B. lonestari* sp. nov. in a subject comprising:

10 contacting a sample from the subject with an antibody having binding specificity for an epitope having an amino acid sequence from SEQ ID NO:2 that includes at least one *B. lonestari* sp. nov.-specific amino acid or species-specific combination of amino acids from Table 1, under conditions allowing epitope-antibody binding to occur to form a complex;

15 wherein complex formation indicates the presence of *B. lonestari* sp. nov.

20 34. A test kit for the detection of *B. lonestari* sp. nov. in a biological sample, the kit comprising in packaged combination:

a carrier means adapted to receive a plurality of container means in close confinement therewith;

25 a first container means including an oligonucleotide having a nucleotide sequence that includes at least one *B. lonestari* sp. nov.-specific nucleotide or species-specific combination of nucleotides from Table 2 or 3, or
30 a complement thereof; and

at least one microtiter plate.

35. A test kit for the detection of *B. lonestari* sp. nov. in a biological sample, the kit comprising in packaged combination:

5 a carrier means adapted to receive a plurality of container means in close confinement therewith;

10 a first container means including a first antibody having binding specificity for an epitope, the epitope having a partial or complete amino acid sequence of SEQ ID NO:2 and including at least one *B. lonestari* sp. nov.-specific amino acid or species-specific combination of amino acids from Table 1; and

15 a second container means including a quantity of a detectably labelled antibody having binding specificity for the first antibody; and

at least one microtiter plate.

20 36. A test kit for the detection of a previously elicited immune response to *B. lonestari* sp. nov. in a biological sample, the kit comprising in packaged combination:

25 a carrier means adapted to receive a plurality of container means in close confinement therewith;

30 a first container means including a peptide epitope, the epitope being a partial or complete amino acid sequence of SEQ ID NO:2 and including at least one *B. lonestari* sp. nov.-specific amino acid or species-specific combination of amino acids from Table 1; and

a second container means including a quantity of a
detectably labelled antibody having binding specificity
for immunoglobulin of the biological sample; and

5 at least one microtiter plate.